

**Application. No. 09/977,137**  
**Amendment dated September 16, 2003**  
**Reply to Office Action of June 17, 2003**

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**Listing of Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A non-naturally occurring recombinant DNA molecule comprising a nucleotide sequence encoding a chelon protein which binds mercuric and cadmium ions, wherein the chelon protein comprises an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12.
2. (Currently amended) The non-naturally occurring recombinant DNA molecule of claim 1 wherein the nucleotide sequence encodes a chelon protein having the amino acid sequence given in amino acids 1 to 107 of SEQ ID NO:4.
- 3-4. (Canceled)
5. (Currently amended) A host cell transformed or transfected to contain with the recombinant DNA molecule of claim 1.
6. (Currently amended) A host cell transformed or transfected to contain with the recombinant DNA molecule of claim 17.
7. (Currently amended) The transformed or transfected host cell of claim 6, wherein the chelon protein which comprises the amino sequence given in amino acids 1 to 107 of SEQ ID NO:4.

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8. (Canceled)
9. (Currently amended) A method for recombinantly producing a chelon protein in a host cell, said method comprising the steps of:
  - a) infecting or transforming a host cell capable of expressing a chelon protein coding sequence with a vector comprising a promoter active in said host cell operably linked to a coding region for said chelon comprising an amino acid sequence as selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12 to produce a recombinant host cell; and
  - b) culturing the recombinant host cell under conditions wherein said chelon is expressed.
10. (Currently amended, withdrawn) A method for removing divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations from a source comprising said cations, said methods comprising the step of contacting the source with a ~~MerR~~ or chelon protein, wherein the chelon protein has an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12, whereby the ~~MerR~~ or chelon protein binds the divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations.
11. (Canceled)

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12. (Currently amended, withdrawn) The method of claim 10 wherein the ~~MerR~~ or chelon protein is bound to a solid substrate and the source is an aqueous material.
13. (Currently amended, withdrawn) The method of claim 10 wherein the ~~MerR~~ or chelon protein is expressed in a transgenic plant cell, transgenic plant tissue or transgenic plant.
14. (Canceled)
15. (Currently amended, withdrawn) A chelon protein ~~having~~ comprising an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to ~~107~~ 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10, amino acids 1 to 107 of SEQ ID NO:11 and amino acids 1 to 107 of SEQ ID NO:12.
16. (Withdrawn) The method of claim 12 wherein the chelon protein is bound to a solid support.
17. (New) The non-naturally occurring recombinant DNA molecule of claim 2 wherein the sequence is the nucleotide sequence of SEQ ID NO:3.